09/820,200

Kaimal, TNB
Indian IN
183639, 2000

L1 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2002 ACS
AN 2002:638336 CAPLUS
DN 137:168654
TI Process for simultaneous conversion of adsorbed oil to alkyl esters and regeneration of commercial spent bleaching earth for reuse
IN **Kaimal, Thengumpillil Narayana Balagopala**; Vijayalakshmi, Penumarthy; Laxmi, Ayyagari Ananta; Ramalinga, Bandi
PA India
SO U.S. Pat. Appl. Publ., 5 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2002115875	A1	20020822	US 2001-788560	20010221

L1 ANSWER 2 OF 4 CAPLUS COPYRIGHT 2002 ACS
AN 2002:483087 CAPLUS
DN 137:34788
TI Process for the isolation of oryzanols from rice bran oil soap stock
IN Rao, Kasturi Venkata Sesha Adinarayana; Rao, Bhamidipati Venkata Surya Koppeswara; **Kaimal, Thengumpillil Narayana Balagopala**
PA Council of Scientific and Industrial Research, India
SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 6410762	B1	20020625	US 2001-813109	20010320

L1 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2002 ACS
AN 2002:84618 CAPLUS
DN 136:120217
TI Hydrolysis and esterification process for the preparation of alkyl esters from commercial lactic acid sources
IN **Kaimal, Thengumpillil Narayana Balagopala**; Vijayalakshmi, Penumarthy; Ramalinga, Bandi; Laxmi, Ayyagari Ananta
PA Council of Scientific & Industrial Research, India
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 6342626	B1	20020129	US 2001-774761	20010131
WO 2002060852	A2	20020808	WO 2002-IN16	20020129

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
PRAI US 2001-774761 A 20010131
RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2002 ACS
AN 1999:104556 CAPLUS
DN 130:158389
TI Process for the isolation of oryzanols from crude dark acid oil (rice bran)
IN Das, Prashanta Kumar; Chaudhuri, Arabinda; **Kaimal, Thengumpillil Narayana Balagopala**; Bhalerao, Uday Triambakaraj
PA India
SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5869708	A	19990209	US 1997-785357	19970117

09/820,200

PATENT ASSIGNEE(S): Lever Brothers Company, New York, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4533501		19850806
APPLICATION INFO.:	US 1983-486647		19830420 (6)

	NUMBER	DATE
PRIORITY INFORMATION:	GB 1982-11563	19820421

DOCUMENT TYPE: Utility
FILE SEGMENT: Granted
PRIMARY EXAMINER: Sneed, Helen M. S.
LEGAL REPRESENTATIVE: Honig, Milton L., Farrell, James J.
NUMBER OF CLAIMS: 21
EXEMPLARY CLAIM: 1
LINE COUNT: 680
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM . . . also lipids themselves may be separated from one another and especially, phospholipids separated from glycerides. In suitable non-polar solvents, e.g. **hexane**, chlorinated hydrocarbons, e.g. chloroform, and ethyl acetate, phospholipids are present in the form of micelles which may have molecular weights. . .

SUMM . . . crude lipids by ultrafiltration is described in which a miscella or solution, for example of a crude glyceride oil in **hexane**, is contacted with an ultrafiltration membrane under sufficient superatmospheric pressure to produce permeate and retentate fractions containing separated components of. . .

SUMM In British Patent Specification No. 764,833 crude oils are simultaneously **degummed** and deacidified by ammonia and the process may be carried out in organic solvents.

SUMM The invention may be applied with advantage to simultaneous deacidification and **degumming** of seed oils containing relatively low amounts of free fatty acids and high phospholipid content, e.g. soyabean, rapeseed, sunflower and linseed oils and which are obtained by **hexane extraction**, without using excessive quantities of water and lye and operating at high temperatures, and without generating large quantities of acid. . . other ecologically harmful effluents. By removal from the crude miscella not only of phospholipids and free fatty acids, thus simultaneously **degumming** and deacidifying the crude oil miscella, but also simultaneously sugars, amino acids, trace metals and soaps, pigments, e.g. gossypol carotenes,. . .

SUMM The invention may also be applied simultaneously to deacidify and **dewax** olive residue oil. This is obtained in a miscella by **hexane extraction** of the olive residues left after expelling virgin oil from olives. Ultrafiltration of the oil neutralised in **hexane** miscella in accordance with the invention is effective not only for removal of free fatty acids but also of the. . .

SUMM Miscella for refining may be made in non-hydroxylic, non-acidic solvents, **hexane** and paraffins generally being preferred, although acetone and esters of good quality are suitable. The solvent must be permeable.

DETD 4 liters of rapeseed oil (FFA 0.12) obtained in a miscella by **hexane extraction** of the pressed seeds, containing 28.6% total lipids and approximately 700 ppm phosphorus as phosphatide

gums were saturated with gaseous. . .

DETD The **hexane** solvent was distilled from 3.6 liters of the permeate obtained with an average flux rate through the membrane of 42. . .

DETD Example 1 was repeated on a miscella of 28 wt % crude soyabean oil in **hexane**, neutralised by adding the stoichiometric amount (0.14% by weight of the oil) of 33 wt % aqueous ammonia. The refined. . .

DETD Refined fish oil was obtained by ultrafiltration as described in Example 1, from a **hexane** miscella containing 28% by weight crude fish oil with FFA 7%. To another part of the crude miscella, 12% of. . . of 33% by weight aqueous ammonia and the same amount of lecithin was added to the neutralised oil in a **hexane** miscella. Each of the miscellae was ultrafiltered as before. The refined oil recovered in each case is compared in Table. . .

DETD TABLE IV

Analyses of starting palm oleine and the permeate oils

Obtained at (.degree.C.)	FFA %	Colour Lovibond 2" cell	UV abspn/1 cm cell E 1% (**hexane** soln) at 232 nm	268 nm
Starting oil	9.2	40 Y 40 R	5.38	1.96
20	0.9	20 Y. . .		

DETD 100 g palm oleine as used in Example 4 was dissolved in 200 g **hexane** and 5.5 g of a solution in methanol containing 71.6% choline hydroxide was added. The permeate oil obtained after ultrafiltration. . .

DETD . . . the ferric oxide went completely into solution. The fat was cooled down to about 30.degree. C., dissolved in 200 g **hexane** and ultrafiltered as described in Example 5 and the permeate oil analysed with the following results:

DETD 3 kg of olive residual oil obtained by the **hexane** **extraction** of pressed olives and with FFA content of 10.5%, was mixed with 300 g defatted soyabean lecithin and the mixture dissolved in 8.17 kg **hexane**. 64 g of a 33% aqueous solution of ammonia was added to the **hexane** miscella and the whole ultrafiltered at 3.8 bar and 20.degree. C. using the Patterson Candy International module and membrane already described in Example 4. After 11 liters of permeate were recovered, 10 liters of **hexane** were added to the unfiltered balance and 9 liters more of permeate recovered. The 20 liters of permeate obtained on. . .

DETD Crude **rice bran oil** with a free fatty acid value of 16 wt % and 300 ppm P, exhibited Lovibond colour in a 2-inch cell of 70 Y+13 R+10 B. A **hexane** miscella comprising 33.degree. wt % of the oil was refined by ultrafiltration through various membranes at 20.degree. C. and 4-barr. . .

DETD In addition, trace metals, **glycolipids** and waxes were efficiently removed in all cases while the level of unsaponifiables was reduced.

DETD A **hexane** miscella comprising 15 wt % crude shea oil containing approximately 2% natural gums, chiefly of polyisoprenoid nature, was saturated with. . .

DETD . . . 4.degree. C. from a 20 wt % solution of acetone. The low-melting (oleine) fraction recovered from the filtrate, dissolved in **hexane** at 33% concentration, was saturated with gaseous ammonia and 2% shea gum residue added by weight of the oil present,. . .

DETD Crude rapeseed oil obtained by pressing the seeds was dissolved in twice the weight of **hexane** and ultrafiltered through a DIAFLO PM10 membrane of Amicon with a cut-off 10,000 at 20.degree. C. and 4 bar using the equipment described in Example 1. The permeate obtained was distilled to remove **hexane** and the oil obtained as residue analysed. In a parallel experiment the same crude rapeseed oil was dissolved in **hexane**, the theoretical amount of 43 wt % aqueous solution of KOH added to the miscella for neutralisation of the free. . .

DETD 100 g crude cottonseed oil (origin Malawi) was dissolved in 200 g **hexane** and ultrafiltered using a polysulphone membrane as in Example 11. The equipment was used as described in Example 1, at. . .

DETD 100 g of crude cottonseed oil (origin Pakistan) was dissolved in 200 g **hexane** using a polyamide membrane BM 100 of BM 100 of Messrs Berghof, Tubingen, Germany, with a cut-off limit of 10,000,. . .

DETD Crude grapeseed oil containing phospholipids was dissolved in double its weight of **hexane** and ultrafiltered at 20.degree. C. and 4 bar pressure, through a polysulphone membrane PM 10 of Messrs Amicon with a. . .

CLM What is claimed is:
15. Process according to claim 14 wherein the said solvent is selected from the group consisting of **hexane**, acetone and alkyl esters.

=> d l5 abs ibib kwic 1-6

L5 ANSWER 1 OF 6 USPATFULL

AB This invention relates to improved methods for treating organic acid-treated phosphatides. More particularly, this invention relates to improved methods comprising providing a phosphatide-containing material obtained from organic acid refining of vegetable oil, adjusting the pH of the phosphatide-containing material to form a neutralized phosphatide, and drying the neutralized phosphatide for a time sufficient to produce a dried phosphatide containing hydrolyzed lecithin.

ACCESSION NUMBER:	2002:217436 USPATFULL
TITLE:	Method for treating organic acid-treated phosphatides
INVENTOR(S):	Copeland, Dick, Omaha, NE, United States Belcher, W. Maurice, Omaha, NE, United States
PATENT ASSIGNEE(S):	IP Holdings, L.L.C., Omaha, NE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6441209	B1	20020827
APPLICATION INFO.:	US 2001-776477		20010202 (9)

RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 2000-550375, filed on 14 Apr 2000, now abandoned Division of Ser. No. US 1998-197953, filed on 20 Nov 1998, now patented, Pat. No. US 6172248
DOCUMENT TYPE:	Utility
FILE SEGMENT:	GRANTED
PRIMARY EXAMINER:	Carr, Deborah D.
LEGAL REPRESENTATIVE:	McDonnell Boehnen Hulbert & Berghoff
NUMBER OF CLAIMS:	10
EXEMPLARY CLAIM:	1

NUMBER OF DRAWINGS: 2 Drawing Figure(s); 2 Drawing Page(s)
LINE COUNT: 873
SUMM . . . density than the triglycerides and precipitate, or settle out. This phenomenon forms the basis for the process of conventional water **degumming**, discussed more fully below.
SUMM . . . 29
ethanolamine
Phosphatidyl 1.7-21 16 13 14
inositol
Phosphatidyl 0.2-6.3 1 -- --
serine
Phosphatidic 0.2-14 9 7 --
acid
Glycolipids 14.3-29.6 30 -- 20
SUMM . . . 29
ethanolamine
Phosphatidyl 1.7-21 16 13 14
inositol
Phosphatidyl 0.2-6.3 1 -- --
serine
Phosphatidic 0.2-14 9 7 --
acid
Glycolipids 14.3-29.6 30 -- 20
SUMM . . . F. and at an absolute pressure of from about 50 mm Hg to about 300 mm Hg. Erickson, David R., **Degumming** and Lecithin Processing and Utilization, in Practical Handbook of Soybean Processing and Utilization 174, 179-80 (David R. Erickson ed. 1995);. . .
SUMM Vegetable oil impurities are typically removed in four distinct steps of **degumming**, refining, bleaching, and deodorizing. Of these four steps, **degumming** removes the largest amount of impurities, the bulk of which are hydratable phosphatides. Refining primarily removes non-hydratable phosphatides, soaps created. . .
SUMM For either refining method, an optional but preferred first step is a conventional water **degumming** process. **Degumming** refers to the process of removing hydratable phosphatides and other impurities such as metals from vegetable oils. A simple **degumming** process comprises admixing demineralized water with the vegetable oil and separating the resulting mixture into an oil component and an. . .
SUMM Normally, refiners also must introduce chelating agents following **degumming** processes to remove metal compounds from crude vegetable oil, which typically contains calcium, potassium, magnesium, aluminum, iron and copper. Left. . .
SUMM Treating crude vegetable oil with demineralized water produces a **degummed** oil and a phosphatide concentrate containing the hydratable phosphatide fraction. This phosphatide concentrate subsequently can be removed from the **degummed** oil by a convenient method such as by gravitational force or by centrifugal separation. Phosphatide concentrates coming from centrifugal separation. . . contamination, phosphatide concentrates must be dried or otherwise treated immediately. Dried phosphatide concentrates can be profitably sold as commercial lecithin. **Degummed** oil is further refined to remove NHPs and other unwanted compounds.
SUMM Mineral acid also is sometimes added during the water **degumming** process to help minimize the NHP content of **degummed** oil. The acid combines with calcium and magnesium salts, enabling phosphatidic acids to migrate from the oil to the water phase, thus eliminating them from the crude oil. However, using mineral acid during **degumming**

is inappropriate when seeking to recover gums intended for use as lecithin because the presence of mineral acid will cause. . .

SUMM In alkali refining, free fatty acids and gums are removed from crude or **degummed** oil by mixing the oil with a hot, aqueous alkali solution, producing a mixture of so-called neutral oil and soapstock. . .

SUMM . . . fraction is destroyed and converted into materials that wind up in the soapstock. And although employing mineral acids during water **degumming** can reduce the overall NHP content prior to alkali treatment by converting the NHPs into water-soluble forms, thus potentially increasing the percentage recovery of the overall phosphatide fraction, using mineral acids during **degumming** causes undesirable darkening of lecithin.

SUMM . . . sunflower seed oil, which are relatively high in NHPs, are not commonly physically refined because the pre-refining step of water **degumming** does not remove NHPs. Moreover, physically refined soybean oils have only limited acceptance in the U.S. market due to their. . .

SUMM . . . to those derived from soybean oil, corn oil, cottonseed oil, palm oil, peanut oil, rapeseed oil, safflower oil, sunflower seed **oil**, sesame seed **oil**, **rice bran** **oil**, coconut **oil**, canola **oil**, and mixtures thereof. A particularly preferred vegetable oil is soybean oil.

SUMM . . . 20:80, depending on the source from which the vegetable oil is derived and on whether the vegetable oil has been **degummed**.

L5 ANSWER 2 OF 6 USPATFULL

AB This invention relates to improved methods for recovering fatty acids during purification of vegetable oil. More particularly, this invention relates to improved methods for recovering fatty acids from a phosphatide-containing material obtained from organic acid refining of vegetable oil.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER:	2002:181811 USPATFULL
TITLE:	Methods for recovering fatty acids
INVENTOR(S):	Copeland, Dick, Omaha, NE, United States Belcher, W. Maurice, Omaha, NE, United States
PATENT ASSIGNEE(S):	I.P. Holdings, Omaha, NE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6423857	B1	20020723
APPLICATION INFO.:	US 2001-808529		20010314 (9)

RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 2000-550375, filed on 14 Apr 2000, now abandoned Division of Ser. No. US 1998-197953, filed on 20 Nov 1998, now patented, Pat. No. US 6172248
DOCUMENT TYPE:	Utility
FILE SEGMENT:	GRANTED
PRIMARY EXAMINER:	Carr, Deborah D.
LEGAL REPRESENTATIVE:	McDonnell Boehnen Hulbert & Berghoff
NUMBER OF CLAIMS:	8
EXEMPLARY CLAIM:	1
NUMBER OF DRAWINGS:	1 Drawing Figure(s); 1 Drawing Page(s)
LINE COUNT:	847

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM . . . density than the triglycerides and precipitate, or settle out. This phenomenon forms the basis for the process of conventional water **degumming**, discussed more fully below.

SUMM Vegetable oil impurities are typically removed in four distinct steps of **degumming**, refining, bleaching, and deodorizing. Of these four steps, **degumming** removes the largest amount of impurities, the bulk of which are hydratable phosphatides. Refining primarily removes non-hydratable phosphatides, soaps created. . .

SUMM For either refining method, an optional but preferred first step is a conventional water **degumming** process. **Degumming** refers to the process of removing hydratable phosphatides and other impurities such as metals from vegetable oils. A simple **degumming** process comprises admixing demineralized water with the vegetable oil and separating the resulting mixture into an oil component and an. . .

SUMM Normally, refiners also must introduce chelating agents following **degumming** processes to remove metal compounds from crude vegetable oil, which typically contains calcium, potassium, magnesium, aluminum, iron and copper. Left. . .

SUMM Treating crude vegetable oil with demineralized water produces a **degummed** oil and a phosphatide concentrate containing the hydratable phosphatide fraction. This phosphatide concentrate subsequently can be removed from the **degummed** oil by a convenient method such as by gravitational force or by centrifugal separation. Phosphatide concentrates coming from centrifugal separation. . . contamination, phosphatide concentrates must be dried or otherwise treated immediately. Dried phosphatide concentrates can be profitably sold as commercial lecithin. **Degummed** oil is further refined to remove NHPs and other unwanted compounds.

SUMM Mineral acid also is sometimes added during the water **degumming** process to help minimize the NHP content of **degummed** oil. The acid combines with calcium and magnesium salts, enabling phosphatidic acids to migrate from the oil to the water phase, thus eliminating them from the crude oil. However, using mineral acid during **degumming** is inappropriate when seeking to recover gums intended for use as lecithin because the presence of mineral acid will cause. . .

SUMM In alkali refining, free fatty acids and gums are removed from crude or **degummed** oil by mixing the oil with a hot, aqueous alkali solution, producing a mixture of so-called neutral oil and soapstock. . .

SUMM . . . fraction is destroyed and converted into materials that wind up in the soapstock. And although employing mineral acids during water **degumming** can reduce the overall NHP content prior to alkali treatment by converting the NHPs into water-soluble forms, thus potentially increasing the percentage recovery of the overall phosphatide fraction, using mineral acids during **degumming** causes undesirable darkening of lecithin.

SUMM . . . sunflower seed oil, which are relatively high in NHPs, are not commonly physically refined because the pre-refining step of water **degumming** does not remove NHPs. Moreover, physically refined soybean oils have only limited acceptance in the U.S. market due to their. . .

SUMM . . . to those derived from soybean oil, corn oil, cottonseed oil, palm oil, peanut oil, rapeseed oil, safflower oil, sunflower seed **oil**, sesame seed **oil**, **rice bran oil**, coconut **oil**, canola **oil**, and mixtures thereof. A particularly preferred vegetable oil is soybean oil.

SUMM . . . 20:80, depending on the source from which the vegetable oil is

derived and on whether the vegetable oil has been **degummed**.
SUMM . . . Rapeseed

Phosphatidyl 12-46 31 14 37
Choline
Phosphatidyl 8-34 3 24 29
Ethanolamine
Phosphatidyl 1.7-21 16 13 14
Inositol
Phosphatidyl 0.2-6.3 1 -- --
Serine
Phosphatidic 0.2-14 9 7 --
Acid
Glycolipids 14.3-29.6 30 -- 20
SUMM . . . Rapeseed

Phosphatidyl 12-46 31 14 37
Choline
Phosphatidyl 8-34 3 24 29
Ethanolamine
Phosphatidyl 1.7-21 16 13 14
Inositol
Phosphatidyl 0.2-6.3 1 -- --
Serine
Phosphatidic 0.2-14 9 7 --
Acid
Glycolipids 14.3-29.6 30 -- 20
SUMM . . . F. and at an absolute pressure of from about 50 mm Hg to about 300 mm Hg. Erickson, David R., **Degumming** and Lecithin Processing and Utilization, in Practical Handbook of Soybean Processing and Utilization 174, 179-80 (David R. Erickson ed. 1995);. . .
SUMM In alkali refining, a small amount of free fatty acids remain in the **degummed** oil and are carried forward to the deodorization step. These additional free fatty acids can be recovered by treatment of. . .

L5 ANSWER 3 OF 6 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 1
AB **Rice bran oil**, not being a seed-derived oil, has a composition qualitatively different from common vegetable oils and the conventional vegetable oil processing technologies are not adaptable without incurring huge losses. The oil's unusual high content of waxes, free fatty acids, unsaponifiable constituents, phospholipids, **glycolipids** and its dark color, all cause difficulties in the refining process. An attempt was made in this investigation to look into factors that are responsible for such difficulties and to develop suitable methodologies for physical refining of **rice bran oil**. Special attention was given to **dewaxing**, **degumming** and deacidification steps. The high content of **glycolipids** (apprx6%) present in the oil was found to be a central problem and their removal appeared crucial for successful processing of the oil. We have also isolated and identified, for the first time, phosphorus-containing **glycolipids** that are unique to this oil. These compounds prevent a successful **degumming** of the oil and their high surface activity leads to unusually high refining losses during alkali refining. A number of simple processes has been evolved, including 1) a simultaneous **dewaxing** and **degumming** process, 2) an unusual enzymatic process to **degum** the oil, 3) processes for the removal of the **glycolipids** including the phosphoglycolipids

and 4) a process for the isolation of the **glycolipids** which may have potential applications in the food, cosmetic and pharmaceutical industries. The processing protocol suggested here becomes the first and only one to produce an oil with less than 5 ppm of phosphorus from crude **rice bran oil**, rendering it thus suitable for physical refining. We believe that the present results are very significant and should contribute to a better utilization of this valuable oil.

ACCESSION NUMBER: 2002:355976 BIOSIS
DOCUMENT NUMBER: PREV200200355976
TITLE: Origin of problems encountered in **rice bran oil** processing.
AUTHOR(S): Kaimal, Thengumpillil Narayana Balagopala (1); Vali, Shaik Ramjan; Rao, Bhamidipati Venkata Surya Koppeswara; Chakrabarti, Pradosh Prasad; Vijayalakshmi, Penumarthy; Kale, Vijay; Rani, Karna Narayana Prasanna; Rajamma, Ongole; Bhaskar, Potula Satya; Rao, Turaga Chandrasekhara
CORPORATE SOURCE: (1) Lipid Science and Technology Division, Indian Institute of Chemical Technology, Hyderabad, 500 007: kaimal@rediffmail.com India
SOURCE: European Journal of Lipid Science and Technology, (April, 2002) Vol. 104, No. 4, pp. 203-211. http://www.eurlipids.com. print. ISSN: 1438-7697.
DOCUMENT TYPE: Article
LANGUAGE: English
TI Origin of problems encountered in **rice bran oil** processing.
AB **Rice bran oil**, not being a seed-derived oil, has a composition qualitatively different from common vegetable oils and the conventional vegetable oil processing. . . are not adaptable without incurring huge losses. The oil's unusual high content of waxes, free fatty acids, unsaponifiable constituents, phospholipids, **glycolipids** and its dark color, all cause difficulties in the refining process. An attempt was made in this investigation to look into factors that are responsible for such difficulties and to develop suitable methodologies for physical refining of **rice bran oil**. Special attention was given to **dewaxing**, **degumming** and deacidification steps. The high content of **glycolipids** (apprx6%) present in the oil was found to be a central problem and their removal appeared crucial for successful processing of the oil. We have also isolated and identified, for the first time, phosphorus-containing **glycolipids** that are unique to this oil. These compounds prevent a successful **degumming** of the oil and their high surface activity leads to unusually high refining losses during alkali refining. A number of simple processes has been evolved, including 1) a simultaneous **dewaxing** and **degumming** process, 2) an unusual enzymatic process to **degum** the oil, 3) processes for the removal of the **glycolipids** including the phosphoglycolipids and 4) a process for the isolation of the **glycolipids** which may have potential applications in the food, cosmetic and pharmaceutical industries. The processing protocol suggested here becomes the first and only one to produce an oil with less than 5 ppm of phosphorus from crude **rice bran oil**, rendering it thus suitable for physical refining. We believe that the present results are very significant and should contribute to. . .
IT Major Concepts
Foods; Methods and Techniques

IT Chemicals & Biochemicals
free fatty acids; **glycolipids**; lipase-G; phospholipids; phosphorus; wax
IT Methods & Equipment
deacidification: food processing method, refining method; **degumming**: food processing method, refining method; **dewaxing**: food processing method, refining method; **rice bran oil** processing: food processing method
IT Miscellaneous Descriptors
rice bran oil: color, fats and oils; unsaponifiable constituents

L5 ANSWER 4 OF 6 FSTA COPYRIGHT 2002 IFIS
AN 2002:N0542 FSTA
AB **Rice bran oil**, has a qualitatively different composition to common vegetable oils. Conventional vegetable oil processing technologies are not adaptable for processing **rice bran** oils as the **oil**'s unusually high content of waxes, free fatty acids, unsaponifiable constituents, phospholipids, **glycolipids** and its dark colour all cause difficulties in the refining process. Factors responsible for such difficulties were investigated and methodologies for physical refining of **rice bran oil** were developed with special attention given to **dewaxing**, **degumming** and deacidification steps. High **glycolipids** content (approx. 5%) in the oil was a central problem and its removal appeared crucial to enable successful processing of the oil. Phosphorus-containing **glycolipids** unique to this oil were isolated and identified; these compounds prevent successful **degumming** of the oil and their high surface activity leads to unusually high refining losses during alkali refining. A number of simple processes were developed for refining rice bran oils including: simultaneous **dewaxing** and **degumming**; enzymic **degumming**; removal of **glycolipids** including phosphoglycolipids; and isolation of **glycolipids** which may have potential applications in the food, cosmetic and pharmaceutical industries. It is suggested that this processing protocol produces an oil with <5 ppm of P from crude **rice bran oil**, which is suitable for physical refining.
TITLE: Origin of problems encountered in **rice bran oil** processing.
AUTHOR: Balagopala Kaimal, T. N.; Ramjan Vali, S.; Koppeswara Rao, B. V. S.; Prasad Chakrabarti, P.; Penumarthy Vijayalakshmi; Vijay Kale; Prasanna Rani, K. N.; Ongole Rajamma; Satya Bhaskar, P.; Chandrasekhara Rao, T.
CORPORATE SOURCE: Lipid Sci. & Tech. Div., Indian Inst. of Chem. Tech., Hyderabad 500 007, India. Tel. +91 40 7193370. Fax +91 40 7193387. E-mail kaimal(a)rediffmail.com
SOURCE: European Journal of Lipid Science and Technology, (2002) 104 (4) 203-211, 25 ref.
ISSN: 1438-7697
DOCUMENT TYPE: Journal
LANGUAGE: English
TI Origin of problems encountered in **rice bran oil** processing.
AB **Rice bran oil**, has a qualitatively different composition to common vegetable oils. Conventional vegetable oil processing technologies are not adaptable for processing **rice**

bran oils as the **oil**'s unusually high content of waxes, free fatty acids, unsaponifiable constituents, phospholipids, **glycolipids** and its dark colour all cause difficulties in the refining process. Factors responsible for such difficulties were investigated and methodologies for physical refining of **rice bran oil** were developed with special attention given to **dewaxing**, **degumming** and deacidification steps. High **glycolipids** content (approx. 5%) in the oil was a central problem and its removal appeared crucial to enable successful processing of the oil. Phosphorus-containing **glycolipids** unique to this oil were isolated and identified; these compounds prevent successful **degumming** of the oil and their high surface activity leads to unusually high refining losses during alkali refining. A number of simple processes were developed for refining rice bran oils including: simultaneous **dewaxing** and **degumming**; enzymic **degumming**; removal of **glycolipids** including phosphoglycolipids; and isolation of **glycolipids** which may have potential applications in the food, cosmetic and pharmaceutical industries. It is suggested that this processing protocol produces an oil with <5 ppm of P from crude **rice bran oil**, which is suitable for physical refining.

CT **GLYCOLIPIDS**; NEUTRALIZATION; OILS VEGETABLE; PROCESSING; REFINING; DEACIDIFICATION; **DEGUMMING**; **DEWAXING**; RICE BRAN OILS

L5 ANSWER 5 OF 6 FROSTI COPYRIGHT 2002 LFRA
AN 431707 FROSTI
AB The effects of the different stages of oil processing on the fate of several minor components are overviewed. These components include free fatty acids, phosphatides, sterols, tocopherols, trace metals, sulfur, carotenoids, chlorophylls, **glycolipids** and pigments. The processing of **rice-bran oil**, soya-bean **oil**, palm oil and red palm olein is described. The **degumming**, neutralisation, bleaching, deodorisation and/or steam deacidification processes are discussed.

TITLE: An overview of influence of processing on minor components of oils and fats.
AUTHOR: Kochhar S.P.
SOURCE: Oils -fats - lipids 1995: proceedings of the 21st World Congress of the ISF, The Hague, October 1995, Volume 1., Published by: PJ Barnes & Associates, Bridgwater, 1996, 167-171 (15 ref.)
International Society for Fat Research
ISBN: 0-9526542-1-0
NOTE: Conference Paper 3B-A
DOCUMENT TYPE: Conference Article
LANGUAGE: English

AB. . . of several minor components are overviewed. These components include free fatty acids, phosphatides, sterols, tocopherols, trace metals, sulfur, carotenoids, chlorophylls, **glycolipids** and pigments. The processing of **rice-bran oil**, soya-bean **oil**, palm oil and red palm olein is described. The **degumming**, neutralisation, bleaching, deodorisation and/or steam deacidification processes are discussed.

L5 ANSWER 6 OF 6 USPATFULL
AB Lipids, especially crude glyceride oils and phosphatides, are refined by contact under superatmospheric pressure with ultrafiltration membrane,

preferably in a miscella in a solvent permeable to the membrane. An additive solute is introduced into the lipid which is impermeable to the membrane to aid the filtration, which may be a phospholipid, gum or soap. The latter may be produced in situ by neutralizing free fatty acid present, especially with ammonia or polyvalent metal compounds and the additives may be introduced in the form of an additional crude lipid.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER:	85:46035 USPATFULL		
TITLE:	Refining		
INVENTOR(S):	Sen Gupta, Achintya K., Schenefeld, Germany, Federal Republic of		
PATENT ASSIGNEE(S):	Lever Brothers Company, New York, NY, United States (U.S. corporation)		

	NUMBER	KIND	DATE	
PATENT INFORMATION:	US 4533501		19850806	
APPLICATION INFO.:	US 1983-486647		19830420	(6)

	NUMBER	DATE
PRIORITY INFORMATION:	GB 1982-11563	19820421

DOCUMENT TYPE:	Utility
FILE SEGMENT:	Granted
PRIMARY EXAMINER:	Sneed, Helen M. S.
LEGAL REPRESENTATIVE:	Honig, Milton L., Farrell, James J.
NUMBER OF CLAIMS:	21
EXEMPLARY CLAIM:	1
LINE COUNT:	680

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM In British Patent Specification No. 764,833 crude oils are simultaneously **degummed** and deacidified by ammonia and the process may be carried out in organic solvents.

SUMM The invention may be applied with advantage to simultaneous deacidification and **degumming** of seed oils containing relatively low amounts of free fatty acids and high phospholipid content, e.g. soyabean, rapeseed, sunflower and. . . other ecologically harmful effluents. By removal from the crude miscella not only of phospholipids and free fatty acids, thus simultaneously **degumming** and deacidifying the crude oil miscella, but also simultaneously sugars, amino acids, trace metals and soaps, pigments, e.g. gossypol carotenes,. . .

SUMM The invention may also be applied simultaneously to deacidify and **dewax** olive residue oil. This is obtained in a miscella by hexane extraction of the olive residues left after expelling virgin. . .

DETD Crude **rice bran oil** with a free fatty acid value of 16 wt % and 300 ppm P, exhibited Lovibond colour in a 2-inch. . .

DETD In addition, trace metals, **glycolipids** and waxes were efficiently removed in all cases while the level of unsaponifiables was reduced.

=>

```
=> s glycolipid? and rice(4a)bran(4a)oil and (degum? or dewax? or de(w)gum? or
de(w)wax?)
         13771 GLYCOLIPID?
         67685 RICE
         13451 BRAN
        629820 OIL
          1189 RICE(4A)BRAN(4A)OIL
          1868 DEGUM?
          5202 DEWAX?
         97871 DE
         51648 GUM?
            10 DE(W)GUM?
         97871 DE
         90466 WAX?
            50 DE(W)WAX?
L1            1 GLYCOLIPID? AND RICE(4A)BRAN(4A)OIL AND (DEGUM? OR DEWAX? OR
              DE(W)GUM? OR DE(W)WAX?)

=> d l1 abs ibib kwic 1

L1   ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2002 ACS
AB   Rice bran oil, not being a seed-derived oil,
     has a compn. qual. different from common vegetable oils and the
     conventional vegetable oil processing technologies are not adaptable
     without incurring huge losses.  The oil's unusual high content of waxes,
     free fatty acids, unsaponifiable constituents, phospholipids,
     glycolipids and its dark color all cause difficulties in the
     refining process.  An attempt was made in this investigation to look into
     factors that are responsible for such difficulties and to develop suitable
     methodologies for phys. refining of rice bran
     oil.  Special attention was given to dewaxing,
     degumming and deacidification steps.  The high content of
     glycolipids (.apprx.6%) present in the oil was found to be a
     central problem and their removal appeared crucial for successful
     processing of the oil.  We have also isolated and identified, for the
     first time, phosphorus-contg. glycolipids that are unique to
     this oil.  These compds. prevent a successful degumming of the
     oil and their high surface activity leads to unusually high refining
     losses during alkali refining.  A no. of simple processes has been
     evolved, including 1) a simultaneous dewaxing and
     degumming process, 2) an unusual enzymic process to degum
     the oil, 3) processes for the removal of the glycolipids
     including the phosphoglycolipids and 4) a process for the isolation of the
     glycolipids which may have potential applications in the food,
     cosmetic and pharmaceutical industries.  The processing protocol suggested
     here becomes the first and only one to produce an oil with less than 5 ppm
     of phosphorus from crude rice bran oil,
     rendering it thus suitable for phys. refining.  We believe that the
     present results are very significant and should contribute to a better
     utilization of this valuable oil.
ACCESSION NUMBER:        2002:331297  CAPLUS
DOCUMENT NUMBER:         137:92965
TITLE:                   Origin of problems encountered in rice
                         bran oil processing
AUTHOR(S):               Narayana, Thengumpillil; Kaimal, Balagopala; Vali,
                         Shaik Ramjan; Surya, Bhamidipati Venkata; Rao,
                         Koppeswara; Chakrabarti, Pradosh Prasad;
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Vijayalakshmi, Penumarthy; Kale, Vijay; Narayana, Karna; Rani, Prasanna; Rajamma, Ongole; Bhaskar, Potula Satya; Rao, Turaga Chandrasekhara
CORPORATE SOURCE: Lipid Science & Technology Division, Indian Institute of Chemical Technology, Hyderabad, 500 007, India
SOURCE: European Journal of Lipid Science and Technology (2002), 104(4), 203-211
CODEN: EJLTFM; ISSN: 1438-7697
PUBLISHER: Wiley-VCH Verlag GmbH
DOCUMENT TYPE: Journal
LANGUAGE: English
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Origin of problems encountered in **rice bran oil** processing

AB **Rice bran oil**, not being a seed-derived oil, has a compn. qual. different from common vegetable oils and the conventional vegetable oil processing technologies are not adaptable without incurring huge losses. The oil's unusual high content of waxes, free fatty acids, unsaponifiable constituents, phospholipids, **glycolipids** and its dark color all cause difficulties in the refining process. An attempt was made in this investigation to look into factors that are responsible for such difficulties and to develop suitable methodologies for phys. refining of **rice bran oil**. Special attention was given to **dewaxing**, **degumming** and deacidification steps. The high content of **glycolipids** (.apprx.6%) present in the oil was found to be a central problem and their removal appeared crucial for successful processing of the oil. We have also isolated and identified, for the first time, phosphorus-contg. **glycolipids** that are unique to this oil. These compds. prevent a successful **degumming** of the oil and their high surface activity leads to unusually high refining losses during alkali refining. A no. of simple processes has been evolved, including 1) a simultaneous **dewaxing** and **degumming** process, 2) an unusual enzymic process to **degum** the oil, 3) processes for the removal of the **glycolipids** including the phosphoglycolipids and 4) a process for the isolation of the **glycolipids** which may have potential applications in the food, cosmetic and pharmaceutical industries. The processing protocol suggested here becomes the first and only one to produce an oil with less than 5 ppm of phosphorus from crude **rice bran oil**, rendering it thus suitable for phys. refining. We believe that the present results are very significant and should contribute to a better utilization of this valuable oil.

ST **rice bran oil** refining **glycolipid** phospholipid removal

IT Food processing
Food viscosity
Surfactants
(origin of problems encountered in **rice bran oil** processing)

IT **Glycolipids**
RL: ADV (Adverse effect, including toxicity); BSU (Biological study, unclassified); REM (Removal or disposal); BIOL (Biological study); PROC (Process)
(origin of problems encountered in **rice bran oil** processing)

IT Fatty acids, biological studies

RL: BSU (Biological study, unclassified); BIOL (Biological study)
(origin of problems encountered in **rice bran oil** processing)

IT Carboxylic acids, biological studies
Phospholipids, biological studies
Waxes
RL: BSU (Biological study, unclassified); REM (Removal or disposal); BIOL (Biological study); PROC (Process)
(origin of problems encountered in **rice bran oil** processing)

IT Fats and Glyceridic oils, biological studies
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); PYP (Physical process); BIOL (Biological study); PROC (Process); USES (Uses)
(rice bran; origin of problems encountered in **rice bran oil** processing)

IT 135371-38-9, Lipase G
RL: FFD (Food or feed use); BIOL (Biological study); USES (Uses)
(origin of problems encountered in **rice bran oil** processing)

IT 77-92-9, Citric acid, biological studies 87-69-4, Tartaric acid, biological studies 102-71-6, Triethanolamine, biological studies 108-24-7, Acetic anhydride 111-42-2, Diethanolamine, biological studies 141-43-5, Ethanolamine, biological studies 144-62-7, Oxalic acid, biological studies 7664-38-2, Phosphoric acid, biological studies
RL: FFD (Food or feed use); PEP (Physical, engineering or chemical process); PYP (Physical process); BIOL (Biological study); PROC (Process); USES (Uses)
(origin of problems encountered in **rice bran oil** processing)

```
=> s glycolipid? and rice(4a)bran(4a)oil and hexane(p)extract?
         13771 GLYCOLIPID?
         67685 RICE
         13451 BRAN
        629820 OIL
          1189 RICE(4A)BRAN(4A)OIL
         89042 HEXANE
        225614 EXTRACT?
          1764 HEXANE(P)EXTRACT?
L2           0 GLYCOLIPID? AND RICE(4A)BRAN(4A)OIL AND HEXANE(P)EXTRACT?

=> d his

     (FILE 'HOME' ENTERED AT 19:02:52 ON 06 SEP 2002)

     FILE 'CAPLUS' ENTERED AT 19:03:04 ON 06 SEP 2002
L1           1 S GLYCOLIPID? AND RICE(4A)BRAN(4A)OIL AND (DEGUM? OR DEWAX? OR
L2           0 S GLYCOLIPID? AND RICE(4A)BRAN(4A)OIL AND HEXANE(P)EXTRACT?

=> index bioscience
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INDEX 'ADISALERTS, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI,
       BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA,
       CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB,
       DDFU, DGENE, DRUGB, DRUGLAUNCH, DRUGMONOG2, ...'
ENTERED AT 19:05:37 ON 06 SEP 2002

63 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view
search error messages that display as 0* with SET DETAIL OFF.

=> s glycolipid? and rice(4a)bran(4a)oil and (degum? or dewax? or de(w)gum? or
de(w)wax?)
          1   FILE BIOSIS
          1   FILE CAPLUS
  16 FILES SEARCHED...
          2   FILE FROSTI
          1   FILE FSTA
  38 FILES SEARCHED...
  50 FILES SEARCHED...
          1   FILE SCISEARCH
          1   FILE TOXCENTER
          3   FILE USPATFULL
  60 FILES SEARCHED...

   7 FILES HAVE ONE OR MORE ANSWERS,   63 FILES SEARCHED IN STNINDEX

L3   QUE GLYCOLIPID? AND RICE(4A) BRAN(4A) OIL AND (DEGUM? OR DEWAX? OR DE(W) G
       UM? OR DE(W) WAX?)

=> file biosis, caplus, frosti, fsta, scisearch, toxcenter, uspatfull
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=> s l3
L4           10 L3

=> dup rem l4
PROCESSING COMPLETED FOR L4
L5            6 DUP REM L4 (4 DUPLICATES REMOVED)

=> s l5 and hexane(p)extract?
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'HEXANE(P)EXTRACT?'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'HEXANE(P)EXTRACT?'
L6            1 L5 AND HEXANE(P) EXTRACT?

=> s l5 and hexane and extract?
L7            1 L5 AND HEXANE AND EXTRACT?

=> d l7 abs ibib kwic 1

L7   ANSWER 1 OF 1  USPATFULL
AB     Lipids, especially crude glyceride oils and phosphatides, are refined by
       contact under superatmospheric pressure with ultrafiltration membrane,
       preferably in a miscella in a solvent permeable to the membrane. An
       additive solute is introduced into the lipid which is impermeable to the
       membrane to aid the filtration, which may be a phospholipid, gum or
       soap. The latter may be produced in situ by neutralizing free fatty acid
       present, especially with ammonia or polyvalent metal compounds and the
       additives may be introduced in the form of an additional crude lipid.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
ACCESSION NUMBER:       85:46035  USPATFULL
TITLE:                  Refining
INVENTOR(S):            Sen Gupta, Achintya K., Schenefeld, Germany, Federal
                        Republic of
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